

1970

**OPERATING
SUMMARY**

FORT FRANCES

***water pollution
control plant***

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F67
W38
1970
MOE

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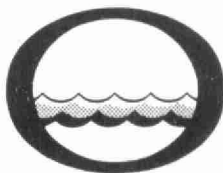
Division of Plant Operations

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Water management in Ontario

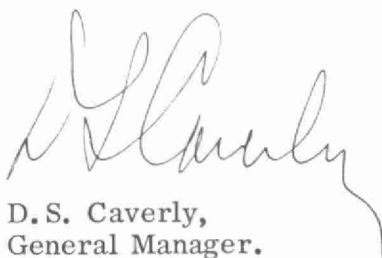
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario


Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D. S. Caverly,
General Manager.



D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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water pollution control plant

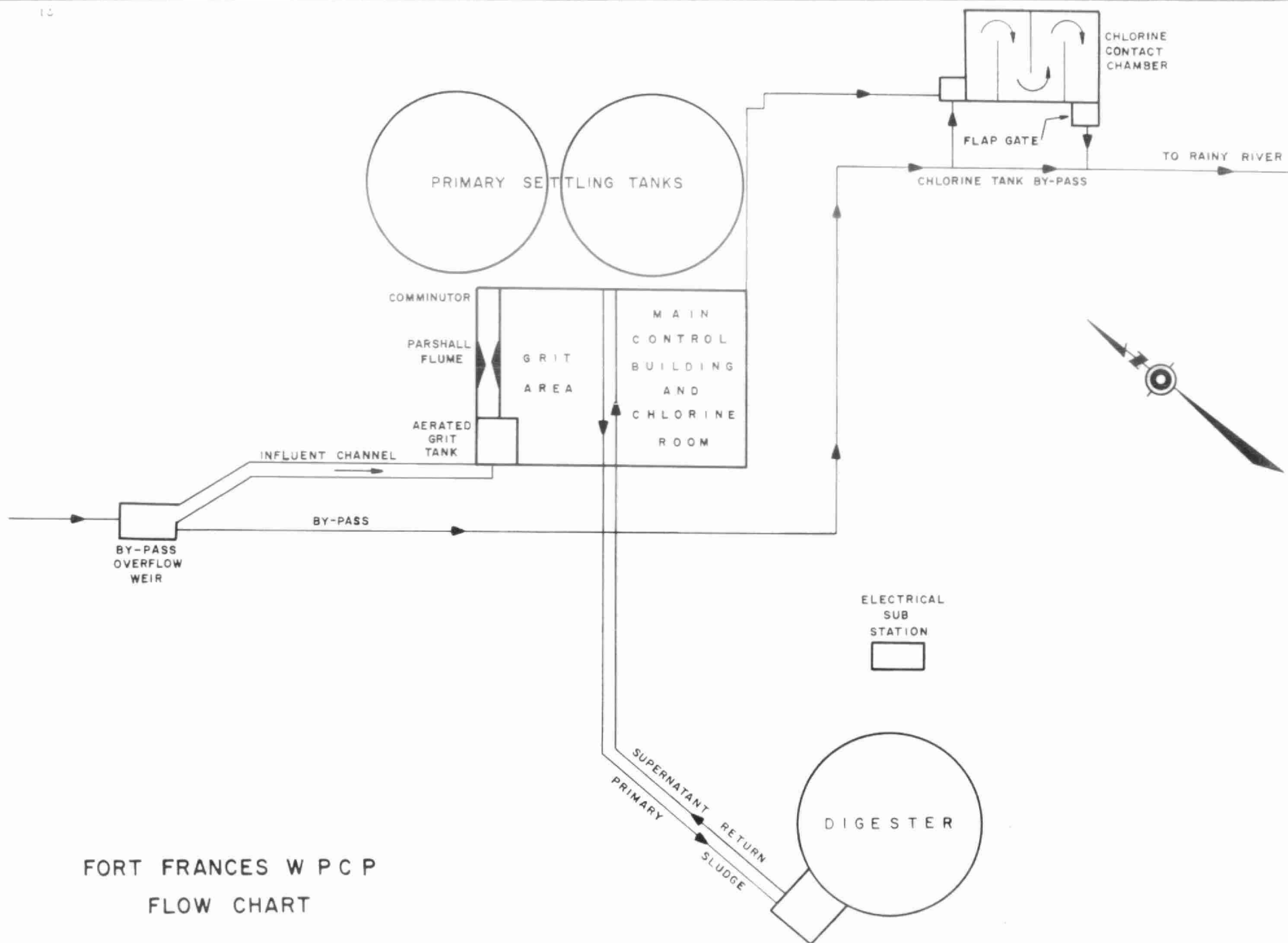
operated for

THE TOWN OF FORT FRANCES

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY



DESIGN DATA

PROJECT NO.	2-0060-59	TREATMENT	Primary
DESIGN FLOW	2.0 mgd	DESIGN POPULATION	12,000
BOD - Raw Sewage	130 mg/l	SS - Raw Sewage	180 mg/l
- Removal	40%	- Removal	60%

PRIMARY TREATMENT

Screening

- Coarse bar screen (2")

Comminution

Type: Smith & Loveless Model 15R

Grit Removal

Type: Aerated; grit removed by clamshell bucket
 Size: One 10' 5" x 10' 5" x 13' 9" swd
 (1515 cu ft or 9,400 gal)
 Retention: 6.8 min

Air Supply

Type: Roots-Connersville
 Size: One 100 scfm @ 9 psi

Primary Sedimentation

Type: Eimco Process
 Size: Two 40' x 40' x 10' swd
 (32,000 cu ft or 200,000 gal)
 Retention: 2.4 hours

Loading: Surface, 625 gal/ft²/day
 Weir, 9,660 gal/ft/day

CHLORINATION

Type: W & T Model A-731
 Size: 400 lb/day

Chlorine Contact Chamber

Size: 27' x 20' x 8.5' (avg)
 (4,590 cu ft or 28,600 gal)
 Retention: 20.6 min

OUTFALL

- to Rainy River

SLUDGE HANDLING

Digestion System

Type: Single stage with floating cover:
 gas mixed
 Size: One 40' dia x 25' swd (31,500 cu ft
 or 195,500 gal)
 Loading: 1.38 lb/cu ft/mo
 Mixer: Roots-Connersville Type XA

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	1.88	—	57.2	—
High	3.4	May, June	83.7	May
Low	1.0	August	40.5	August

GENERAL

Operation, in addition to the Pollution Control plant, includes two Ontario Water Resources Commission pumping stations and three municipal stations. Plant staff remained at one chief operator and two operators. Plant efficiency was good in 1970, due probably to the overall reduction in flow.

EXPENDITURES

The total operating cost was \$44,640.95; 54 percent of this was for salaries.

The average cost per million gallons treated was \$65.00. The cost per pound of BOD removed was 14 cents.

PLANT FLOW and CHLORINATION

A total of 686.4 million gallons of sewage was treated before discharge to the Rainy River. The maximum daily flow was 3.4 million gallons, 170 percent of nominal design flow. The minimum daily flow was 1.0 million gallons.

During the summer months, from May to November, chlorine was applied at an average dosage of 3.4 mg/l. A total of 10,200 pounds of chlorine was utilized during this period.

PLANT EFFICIENCY

The average influent BOD was 83 mg/l and the suspended solids content 129 mg/l. These were reduced 55 and 60 percent respectively to give average effluent contents of 37 mg/l BOD and 60 mg/l suspended solids.

A total of 540 cubic feet of grit was removed during the year.

SLUDGE DIGESTION and DISPOSAL

A total of 725,000 gallons of sludge was pumped to the digester at 3.4 percent total solids. Digestion and compaction was achieved and 580,000 gallons of digested sludge at six percent total solids were removed by tank truck.

CONCLUSIONS

Flows in 1970 were slightly below those of 1969. The volume of sludge pumped to the digester was also slightly less. Since the problem with the plant has always been diluted sewage, two factors may have contributed to this.

- a) Decreased precipitation
- b) Municipal control of infiltration reaching the sewers.

Although the situation was slightly improved over 1969, the plant was still hydraulically overloaded some 30 percent of the time and efforts to reduce infiltration must continue.

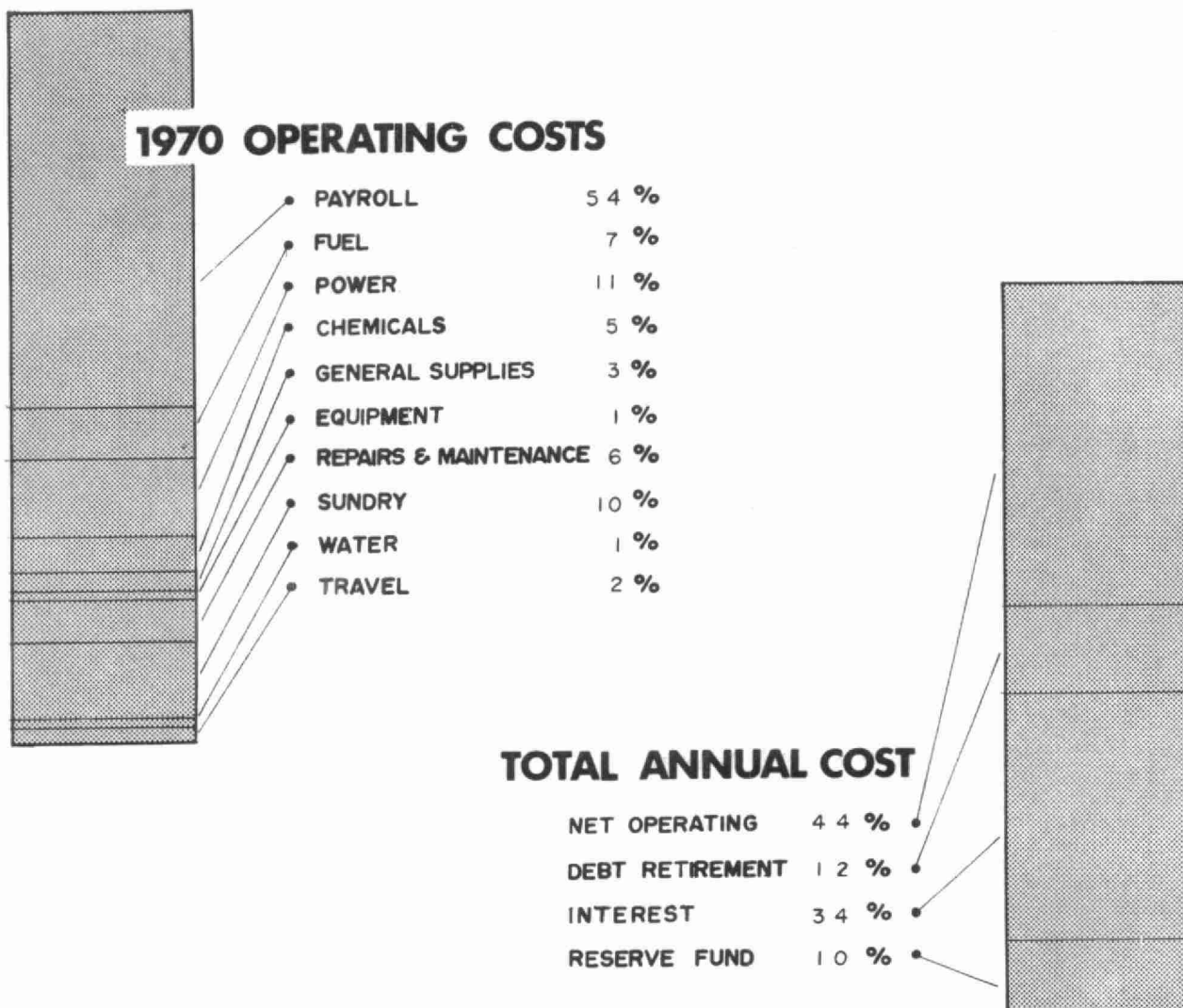
Anticipated enlargement of the collector system will further aggravate the problem.

PROJECT COSTS

NET CAPITAL COST (Final)	\$1, 894, 347. 61
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>1, 276, 239. 07</u>
Long Term Debt to OWRC	\$ <u>618, 108. 54</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	\$ <u>103, 577. 99</u>
Net Operating	\$ 44, 640. 95
Debt Retirement	12, 473. 00
Reserve	9, 695. 21
Interest Charged	<u>34, 630. 28</u>
TOTAL	\$ <u>101, 439. 44</u>

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 69, 643. 27
Deposited by Municipality	9, 695. 21
Interest Earned	<u>4, 731. 13</u>
Less Expenditures	<u>-</u>
Balance @ December 31, 1970	\$ <u>84, 069. 61</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	762.339	32,057.25	42.04	11 cents
1967	691.262	35,624.59	51.54	13 cents
1968	736.200	36,705.23	49.86	11 cents
1969	692.810	38,741.52	55.92	13 cents
1970	686.4	44,640.95	65.04	14 cents

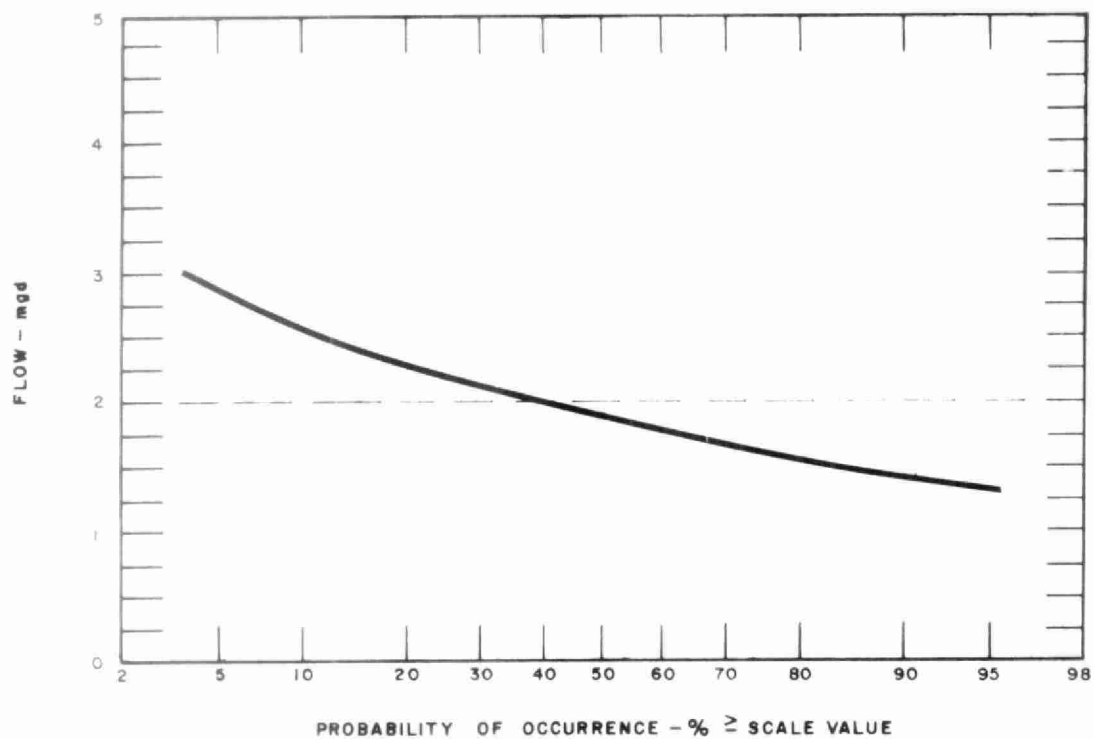
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	3823.65	2682.89	-	875.69	164.27	-	-	-	-	100.80	-	-
FEB	3471.67	1909.93	-	850.58	513.71	-	60.45	9.61	34.25	60.64	32.50	-
MAR	2995.08	1925.10	-	-	381.02	-	172.25	-	423.57	60.64	32.50	-
APR	3564.00	1872.87	-	444.60	453.44	-	81.01	50.55	399.33	130.26	38.71	93.23
MAY	3031.00	2051.54	-	-	468.50	-	126.70	-	53.77	215.99	32.50	82.00
JUNE	3325.09	1880.70	-	401.85	436.43	-	76.01	-	438.46	59.14	32.50	-
JULY	5117.70	1916.78	-	357.73	451.01	987.54	156.76	2.93	341.25	750.45	32.50	120.75
AUG	3783.45	2718.43	-	14.00	357.70	179.08	4.73	170.10	213.84	86.57	39.00	-
SEPT	4165.50	1822.38	-	-	336.31	-	77.51	-	169.50	1636.80	39.00	84.00
OCT	3440.41	1806.28	-	-	372.77	447.70	72.93	-	160.34	442.48	39.00	98.91
NOV	3507.56	1804.59	-	-	248.84	626.78	235.11	55.61	68.33	345.30	39.00	84.00
DEC	4415.84	1773.35	-	146.14	766.91	-	401.24	-	447.04	674.63	78.00	128.53
TOTAL	44640.95	24164.84	-	3090.59	4950.71	2241.10	1464.70	288.80	2749.68	4563.70	435.21	691.42

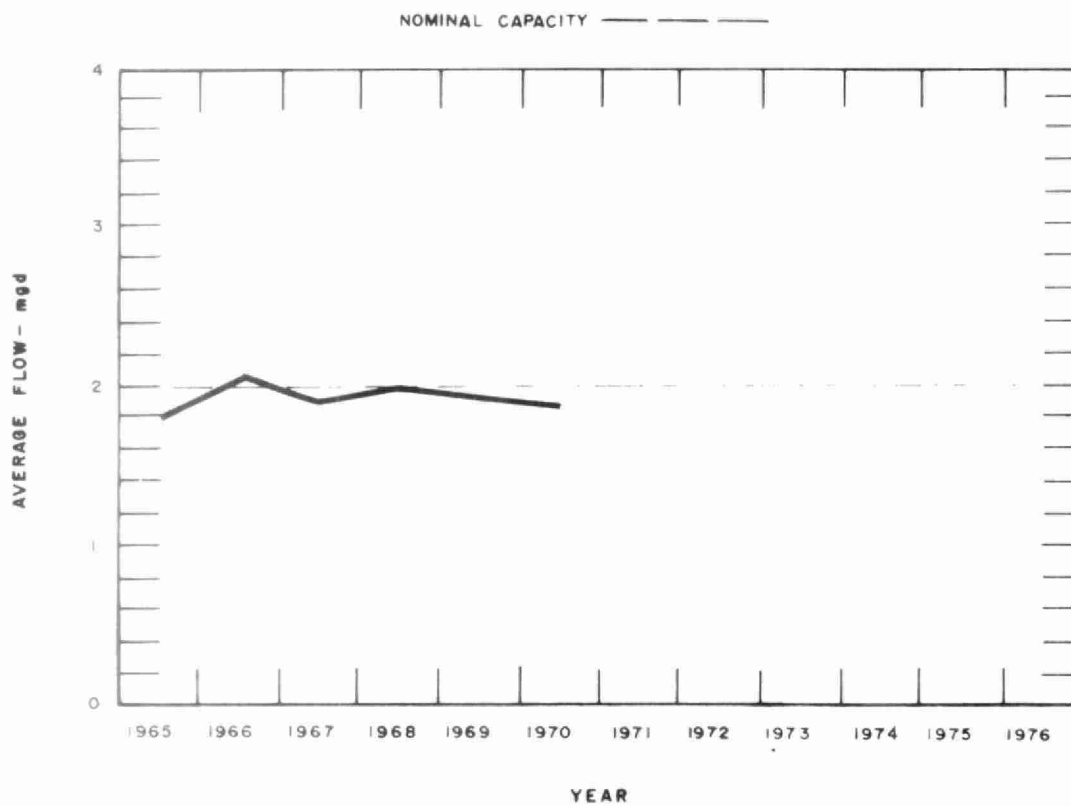
BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$2,772.00

PROCESS DATA



FLAWS

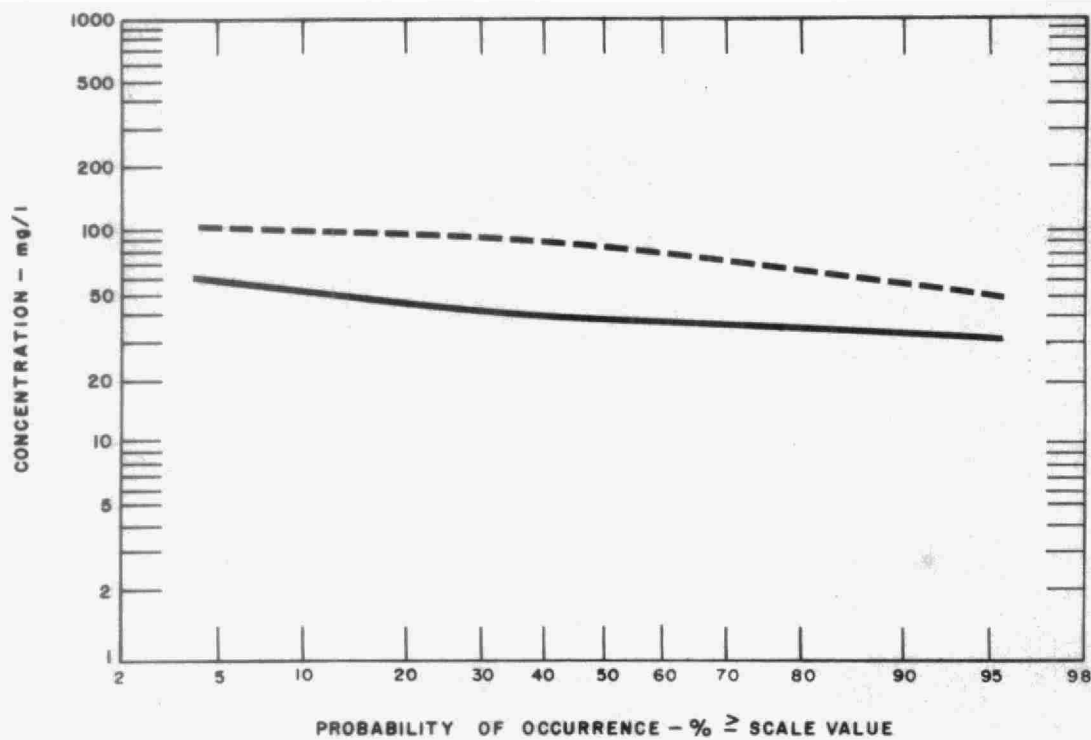


PLANT FLOWS and CHLORINATION

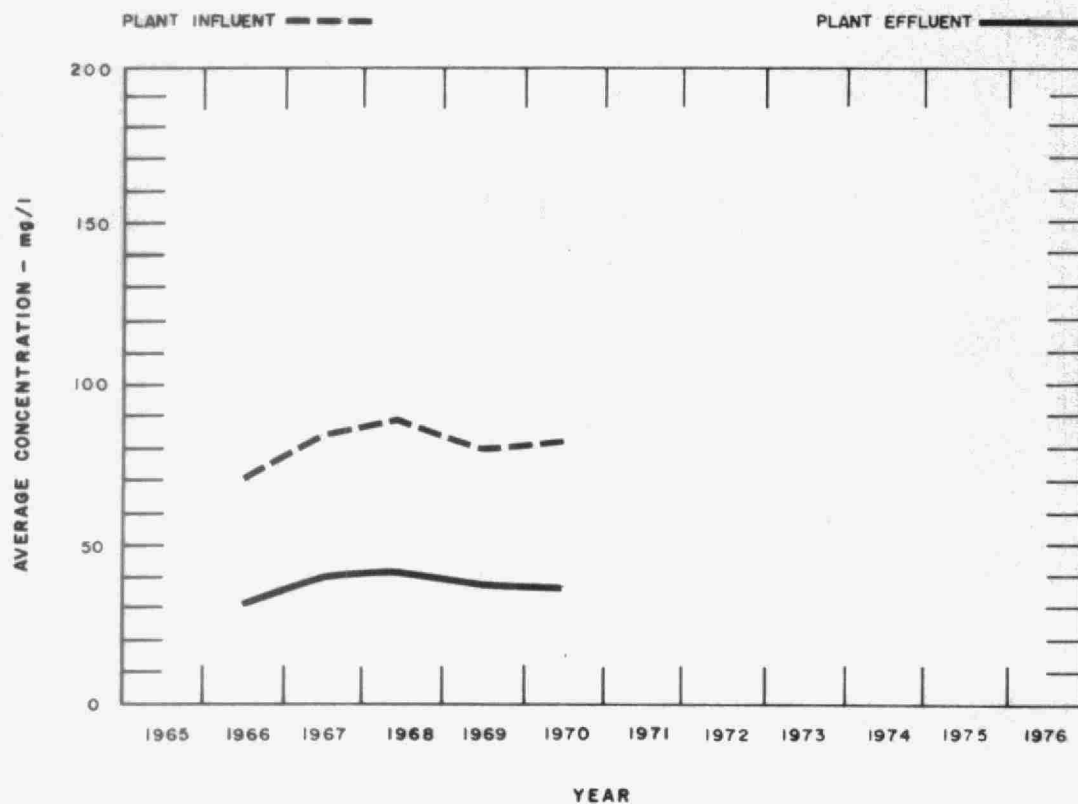
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 ³ pounds	DOSAGE mg/l
JAN	55.6	1.80	2.0	1.7	0	0
FEB	50.2	1.80	2.2	1.7	0	0
MAR	63.8	2.06	2.7	1.8	0	0
APR	69.2	2.31	3.2	1.7	0	0
MAY	83.7	2.70	3.4	1.4	1.2*	1.4
JUNE	65.3	2.17	3.4	1.6	1.8	2.8
JULY	46.9	1.51	1.8	1.3	1.7	3.7
AUG	40.5	1.31	1.6	1.0	1.7	4.1
SEPT	42.7	1.42	1.8	1.2	1.7	3.9
OCT	56.9	1.83	2.6	1.4	2.1	3.7
NOV	59.1	1.97	2.6	1.6	**	-
DEC	52.5	1.69	2.1	1.4	-	-
TOTAL	686.4	-	-	-	10.2	-
AVERAGE	-	1.88	-	-	1.7	3.4

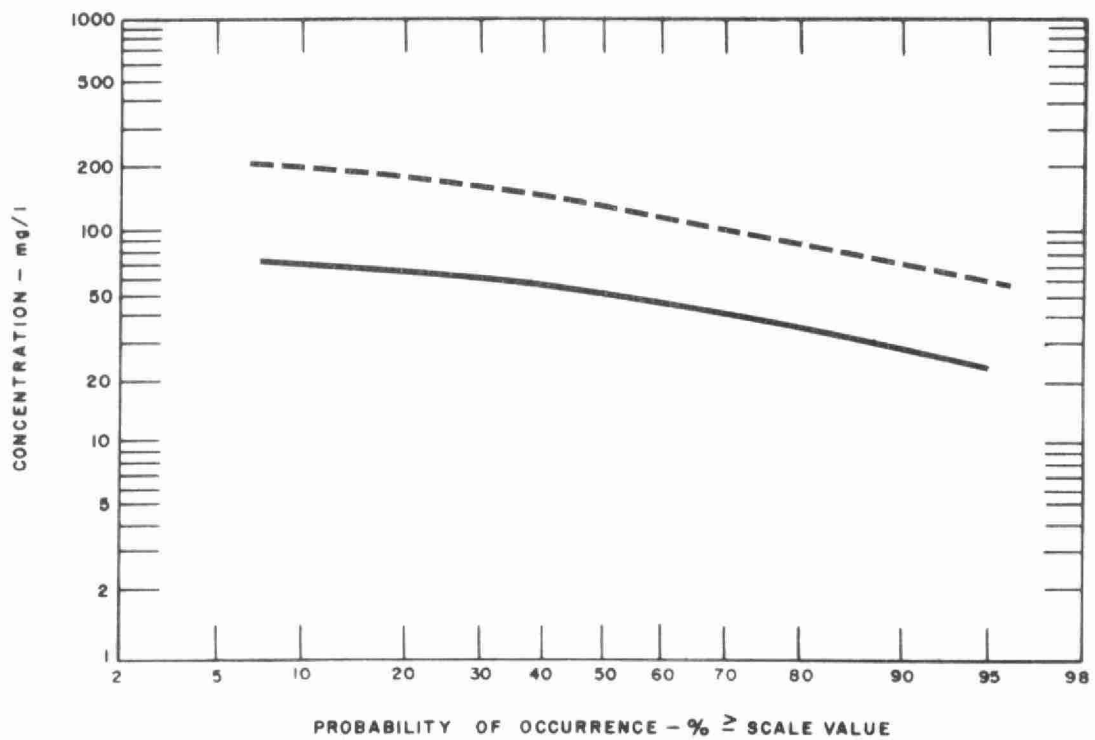
* May 14

** Nov. 1

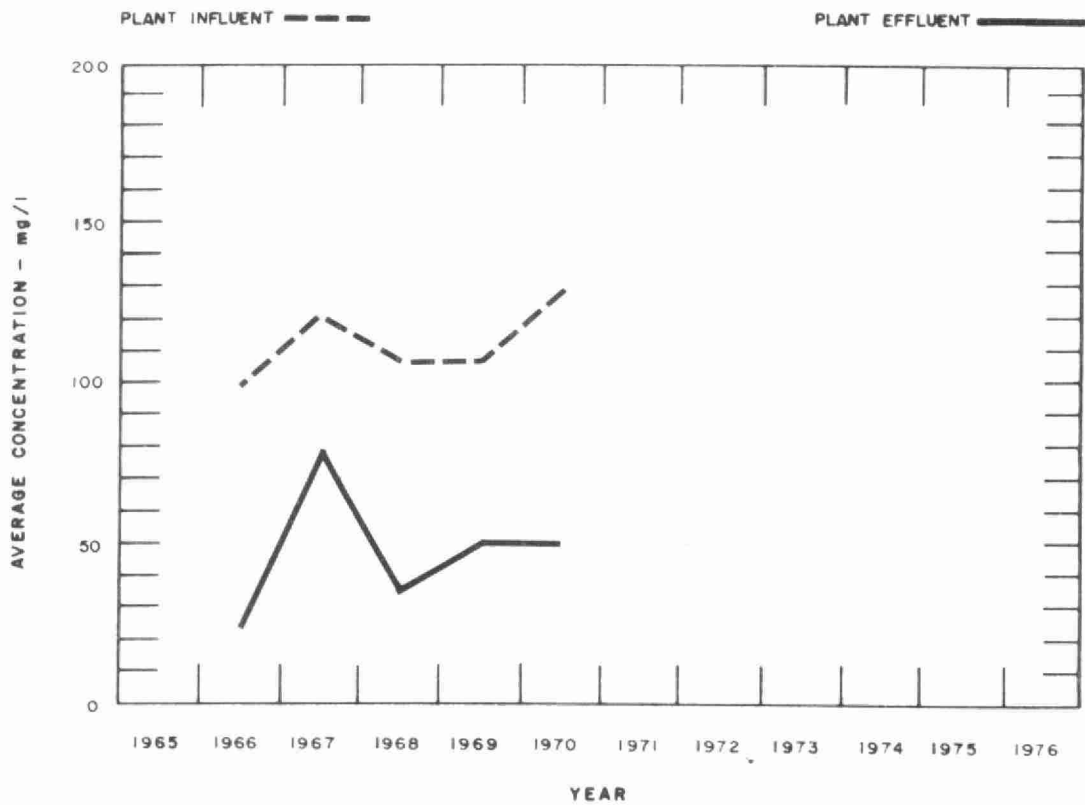


BIOCHEMICAL OXYGEN DEMAND





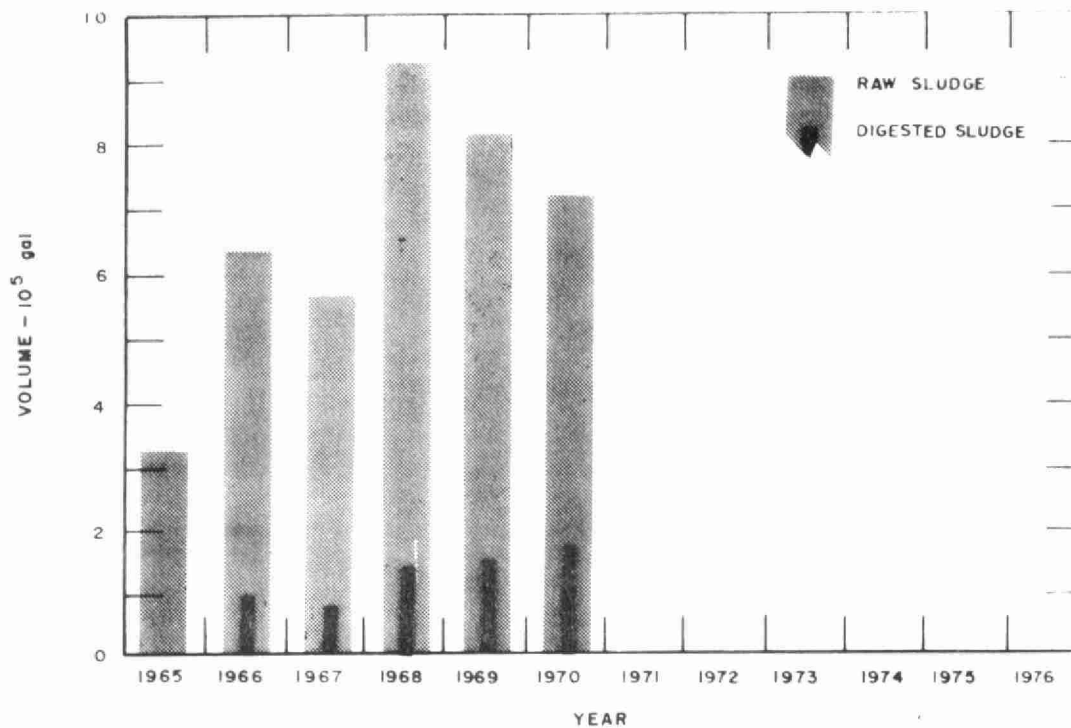
SUSPENDED SOLIDS



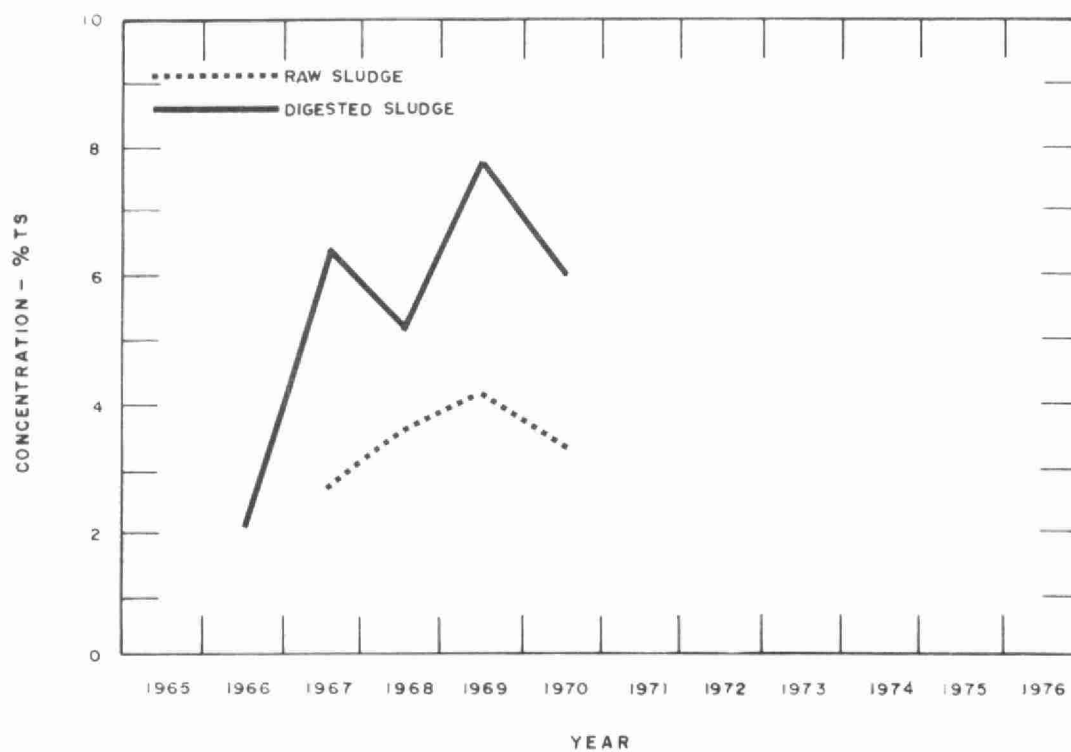
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	4	84	4	37	56	26	4	98	4	44	55	30	3
FEB	5	93	5	33	65	30	5	115	5	45	61	35	23
MAR	5	79	5	38	52	26	5	99	5	45	54	34	10
APR	5	89	5	40	55	34	5	94	5	38	60	39	62
MAY	5	79	5	36	54	36	5	89	5	34	62	72	110
JUNE	4	73	4	35	52	25	4	71	4	37	48	22	78
JULY	5	84	5	38	54	22	5	129	5	41	68	41	7
AUG	1	95	1	26	73	28	2	178	2	54	70	50	57
SEPT	5	84	5	37	56	20	5	195	5	78	60	50	123
OCT	4	74	4	37	50	21	5	135	5	51	62	48	15
NOV	4	74	4	37	50	22	4	117	4	62	47	32	40
DEC	5	91	5	43	53	25	5	235	5	89	62	77	12
TOTAL	52	-	52	-	-	315	54	-	54	-	-	530	540
AVERAGE	-	83	-	37	55	26	-	129	-	52	60	44	45

NOTE - n is the number of samples taken



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ³ gal	%	%	10 ³ gal	%	%	10 ³ gal	%	cu yd	cu yd
JAN	54	2.3	70	3	5.0	-	46	.3	-	18
FEB	51	3.0	72	3	5.0	54	47	.3	-	18
MAR	55	2.2	64	4	5.7	53	51	.3	-	24
APR	62	2.4	66	12	4.4	57	49	.3	-	72
MAY	80	4.5	55	23	8.1	44	43	.4	-	138
JUNE	63	2.5	67	19	5.0	55	46	.1	-	114
JULY	65	4.0	65	21	5.0	51	43	.1	-	126
AUG	65	4.0	60	21	8.0	40	41	.8	-	126
SEPT	59	4.0	48	23	7.0	44	41	.1	-	138
OCT	55	4.0	50	19	6.0	49	35	.1	-	114
NOV	51	3.0	64	10	8.0	47	19	.1	-	60
DEC	65	5.0	43	18	5.0	55	47	.1	-	108
TOTAL	725	-	-	176	-	-	508	-	-	1056
AVERAGE	60	3.4	60	15	6.0	50	42	.3	-	88

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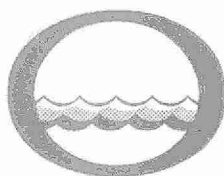
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Water management in Ontario